The marginal cost of public funds: Hours of work versus labor force participation

Henrik Jacobsen Kleven [a,*], Claus Thustrup Kreiner [b]

[a] *University of Copenhagen, EPRU, and CEPR, Denmark*
[b] *University of Copenhagen, EPRU, and CESifo, Denmark*

Abstract

This paper extends the theory and measurement of the marginal cost of public funds (MCF) to account for labor force participation responses. Our work is motivated by the emerging consensus in the empirical literature that extensive (participation) responses are more important than intensive (hours of work) responses. In the modelling of extensive responses, we argue that it is crucial to account for the presence of non-convexities created by fixed work costs. In a non-convex framework, tax and transfer reforms give rise to discrete participation responses generating first-order effects on government revenue. These revenue effects make the marginal cost of funds higher and we show numerically that the implications for MCF tend to be substantial.
© 2006 Elsevier B.V. All rights reserved.

1. Introduction

Economists have long been concerned with the optimal level of government spending. The classic formulation of the problem goes back to Samuelson (1954) who analyzed the case where government is financed entirely by lump sum taxation. His analysis was later extended by Stiglitz and Dasgupta (1971) and Atkinson and Stern (1974) to account for the more realistic situation where revenue has to be raised by distortionary taxation. These papers demonstrated that a crucial

* Corresponding author. Institute of Economics, University of Copenhagen, Studiestræde 6, DK-1455 Copenhagen K, Denmark. Tel.: +45 35 32 44 15; fax: +45 35 32 30 00.
E-mail address: henrik.kleven@econ.ku.dk (H.J. Kleven).

factor for the optimal size of government is the marginal welfare cost of raising revenue by distortionary taxes, subsequently labelled the marginal cost of public funds (MCF) by Browning (1976).

The contribution by Browning and the literature that followed discussed theoretically how to measure the MCF and tried to estimate its value, typically for the United States. Some papers were based on analytical approaches (Browning, 1987; Mayshar, 1991; Snow and Warren, 1996; Dahlby, 1998), while others were based on computer simulation techniques (Stuart, 1984; Ballard et al., 1985; Ballard, 1990; Ballard and Fullerton, 1992). Considerable effort has been devoted to reconciling disparities in reported estimates arising from different assumptions about the nature of government spending, the type of tax used to finance spending and labor market behavior.

Despite the differences just mentioned, there are important similarities across the existing studies. First of all, most of the work has focused on the effect of taxation on labor supply and a lot of attention has been given to the role of the labor supply elasticity for the size of MCF. Secondly, all of the previous studies employed the standard convex model of labor supply, where individual hours of work is determined by the local slope of the budget constraint. In this framework, if the local slope of the budget line changes a little bit, individuals change hours worked a little bit. Hence, there are no discrete changes in labor supply. Thirdly, the literature considers labor supply responses only along the intensive margin, i.e., changes in hours worked for those who are working. Labor supply responses along the extensive margin–the margin of entry and exit–were ignored.

This focus on hours worked for those who are working conflicts with the empirical labor market literature showing that almost all of the observed variation in labor supply is generated by changes in labor force participation (Heckman, 1993; Blundell and MaCurdy, 1999). In fact, participation elasticities seem to be very large for certain subgroups of the population, typically people at the lower end of the earnings distribution. For example, recent expansions to tax-based transfers in the United States created large effects on female labor force participation (Eissa and Liebman, 1996; Meyer and Rosenbaum, 2001). By contrast, hours-of-work elasticities estimated conditional on working tend to be very close to zero across different demographic subgroups and earnings levels.

Saez (2002) has demonstrated that the incorporation of extensive labor supply responses has important implications for the theory of optimal income taxation. In this paper, we explore the implications of extensive labor supply responses for the marginal cost of funds, theoretically as well as empirically. In the modelling of extensive responses, we argue that it is crucial to account for the discreteness of participation behavior. Indeed, empirical distributions of working hours show almost no workers at low annual or weekly hours of work (Eissa et al., 2004). To be consistent with such a distribution, we have to drop the convex model of labor supply, since it implies that marginal increases in the net-of-tax wage induce entry at infinitesimal hours of work. Instead, we set up a model where small tax changes can induce entry at high working hours (say, part-time or full-time work). In the empirical labor market literature, discrete entry is typically explained by fixed work costs creating non-convexities in preferences and in the budget set (e.g., Cogan, 1981). In a model accounting for fixed work costs, we show that extensive responses entail first-order effects on government revenue, which unambiguously increase the size of MCF.

We make an empirical contribution by estimating the MCF for a number of European countries. Almost all previous attempts at estimating the MCF were based on a single-agent approach, an exception being the computable general equilibrium (CGE) study by Ballard et al. (1985). Because of the large observed heterogeneity in earnings, taxes, transfers and labor supply responses, any attempt to estimate MCF based on a single-agent approach will be prone to substantial errors. In fact, because participation responses are strongly concentrated at the bottom